APPENDICES

Summary of the Guide to the California Reading Initiative Legislation, Requirements, and Funding Sources 1996-97, 1997-98, and 1998-99

Component	Bill No.	Ch./Yr.	Title	Gr.	Appropriation
Instructional Materials	**AB 2041** (Bustamante)	(Ch. 312/98) Ed. Code § 60450	Instructional Materials	K-8	$250 million
	Establishes the State Instructional Fund as a means of annually funding the acquisition of standards-based instructional materials (priority given to mathematics and language arts).				
	AB 2519 (Poochigian)	(Ch. 481/98) Ed. Code § 60200.1	Instructional Materials	K-8	None
	Requires that the State Board of Education adopt basic instructional materials for use in K-8, in language arts (2002). Also permits the SBE to adopt a policy allowing for additional submissions and adoptions of instructional materials in language arts and reading, including spelling as described under 5(A and B) in Section II.				
	AB 3482 (Davis, Johnston)	(Ch. 196/96) Ed. Code § 60350-60352	Core Reading Materials	K-3	$152 million (General funds)
	Requires core reading materials to be furnished to each pupil in K-3 to meet the following requirements: 1. The instructional materials have been adopted by the SBE in 1996. 2. The instructional materials meet the requirements of § 60200.4 (“ABC” Bills: AB 170, AB 1504). 3. The instructional materials include, but are not necessarily limited to, phoneme awareness, systematic explicit phonics, and spelling patterns, accompanied by reading material that provides practice in the lesson being taught.				
	AB 170 (Alpert, Burton, Conroy)	(Ch 765/95) Ed. Code § 60200.4	Instructional Materials	K-8	None
	Requires the State Board of Education (SBE) to ensure that instructional materials K-8 for mathematics and reading are based on fundamental skills required by these subjects, including systematic, explicit phonics, spelling, and basic computational skills; and that they should be included in the adopted curriculum frameworks, and that these skills and related tasks increase in depth and complexity from year to year.				
	AB 1504 (Burton)	(Ch. 764/95) Ed. Code § 60200	Instructional Materials: Spelling	K-8	None
	Requires that language arts materials K-8 include spelling.				

Component	Bill No.	Ch./Yr.	Title	Gr.	Appropriation
Staff Development (Inservice Training)	**AB 1656** **Goals 2000**	(Ch. 324/98) (PL 103-277)	New Teacher Reading Professional Development	K-3	$6 million
	Extends the authorization of AB 1086 (Chapter 286, 1997). Programs of inservice training that consists of, but is not limited to, the 12 elements at the K-3 levels as specified in AB 1086. Participants will be K-3 teachers (including special education teachers, reading specialists, and any others providing direct instruction).				
	AB 1656 **Goals 2000**	(Ch. 324/98) (PL 103-277)	Reading Standards and Interventions Programs	4-12	$30.5 million
	Extends authorization of AB 1086 (Chapter 286, 1997). Programs of inservice training that consist of, but is not limited to, the 10 elements at the 4-8 levels as specified in AB 1086, and meet the same specifications as the K-3 program. Participants will be schools with teachers who (1) teach in self-contained classes, or (2) teach in a departmentalized school and who either (a) teach remedial reading, or (b) provide direct instruction in reading as part of their classes.				
	AB 1086 (Mazzoni, Baldwin, Pacheco, co-author Senator Hughes) **Goals 2000**	(Ch. 286/97) (PL 103-277)	Reading Instruction Development Program	K-3 4-8	$52 million
	Programs of inservice training funded pursuant to AB 1086 for teachers of pupils in grades K-3 must include, but are not limited to, all of the following subjects: 1. Phoneme awareness instruction 2. Systematic, explicit phonics instruction 3. Decoding instruction and the diagnosis of a pupil's ability to decode 4. Word-attack skills instruction 5. Spelling and vocabulary instruction 6. Explicit instruction of comprehension skills 7. Research on how reading skills are acquired 8. Effective integration of listening, speaking, reading and writing 9. Effective classroom and schoolwide interventions for low-performing readers 10. Ways to promote extensive, self-selected independent reading 11. Effective reading instruction for English language learners 12. Planning and delivery of appropriate reading instruction based on assessment and education				
	AB 3482 (Davis, Johnston)	(Ch. 196/96)	Education: Teacher Reading Instruction	K-3	$13 million (General Funds)
	The staff development and reading leadership training programs shall address: a. Systematic, explicit phonics instruction b. Phoneme awareness c. Sound-symbol relationships				

Component	Bill No.	Ch./Yr.	Title	Gr.	Appropriation
Staff Development (Inservice Training) ***(continued)***	**AB 3482** (Davis), *continued* d. Decoding e. Word attack skills f. Spelling instruction g. Diagnosis of reading deficiencies h. Research on how children learn to read i. Research on how proficient readers read j. Structure of the English language k. Relationships between reading, writing, and spelling l. Planning and delivery of appropriate reading instruction based on assessment and evaluation m. Student independent reading of good books and the relationship of that activity to improved reading performance				
	Goals 2000	(1995-96 FY) (PL 103-277)	School District K-3 Reading Staff Development Subgrants	K-3	$26.4 million
	Grants to districts for inservice training of K-3 teachers and district/school administrators. The inservice program must include all of the following topics: a. Phoneme awareness b. Systematic, explicit phonics instruction c. Spelling instruction d. Diagnosis of reading deficiencies e. Research on how children learn to read f. Research on how proficient readers read g. Structure of the English language h. Relationships between reading, writing, and spelling i. Planning and delivery of appropriate reading instruction based on assessment and evaluation j. Means of improving reading comprehension k. Pupil independent reading of good books and the relationship of that activity to improved reading performance				
Preservice Training	**Goals 2000**	(1996-97 FY) (PL 103-277)	Preservice Reading Partnership Grants		$4 million Pursuant to 1997-98 Budget Act (AB 107, Ch. 282/97)
	Grants to county offices of education or school districts to develop partnerships with institutions of higher education to improve teacher preparation in reading instruction (extension to 1995/96 provisions).				
	Goals 2000	(1995-96 FY) (PL 103-277)	Preservice Reading Partnership Grants		$6 million
	Grants to county offices of education or school districts to develop partnerships with institutions				

Component	Bill No.	Ch./Yr.	Title	Gr.	Appropriation
Preservice Training *(continued)*	of higher education to improve teacher preparation in reading instruction. The program may include curriculum development for preservice instruction, or instruction itself which addresses the following topics: a. Phoneme awareness b. Systematic, explicit phonics instruction c. Spelling instruction d. Diagnosis of reading deficiencies e. Research on how children learn to read f. Research on how proficient readers read g. Structure of the English language h. Relationships between reading, writing, and spelling i. Planning and delivery of appropriate reading instruction based on assessment and evaluation j. Means of improving reading comprehension k. Pupil independent reading of good books and the relationship of that activity to improved reading performance				
Credential Requirements	**AB 1178** (Cuneen)	(Ch. 919/96)	Teacher Credentialing Inservice Training for Reading Instruction		(Reappropriates $1 million in Goals 2000 Funds)
	Requires the Commission on Teacher Credentialing (CTC) to develop, adopt, and administer a reading instruction competence assessment to measure an individual's knowledge, skill, and ability relative to effective reading instruction. Includes in the requirements for the preliminary multiple subject teaching credential successful passage of one of two specified components of the assessment.				
	AB 3075 (Baldwin, Murray)	(Ch. 921/96)	Teacher Credentialing		$100,000 (General Funds)
	Requires that minimum requirements for a multiple subject or single subject teaching credential also include satisfactory completion of a comprehensive reading instruction that is research-based and includes the study of direct, systematic, explicit phonics.				
	SB 1924 (Dills)	(Ch. 1067/96)	Teaching Credentials		None
	Requires CTC to establish standards for a restricted reading certificate. Authorizes CTC to issue a restricted reading certificate.				
	SB 1568 (Dills)	(Ch. 1068/96)	Teacher Credentials		None
	Requires, for the 1996-97 fiscal year and each fiscal year thereafter, school districts to maintain the same level of expenditures on reading specialists that it expended in the 1995-96 fiscal year. The standards and qualifications for the restricted reading certificate shall include, but not be limited to, demonstrated knowledge of: A. Current and confirmed research in the teaching of basic reading skills, including research in ongoing, diagnostic techniques that inform teaching and assessment B. Techniques for teaching basic reading skills that include direct instruction in phoneme awareness, direct systematic, explicit phonics, and comprehension skills				

Component	Bill No.	Ch./Yr.	Title	Gr.	Appropriation
Credential Requirements	C. Early intervention techniques D. Guided practice within a clinical setting				
(continued)	**Goals 2000**	(1995-96 FY) (PL 103-277)	Reading Instructional Competency Assessment (RICA)		$1 million (State Operations)
	Provides funding to the CTC to develop an assessment of reading instructional competency for new teachers. (see also AB 1178)				
Class Size Reduction **SB 804 Ch. 298/97**	**SB 1777** (O'Connell)	(Ch. 163/96)	Class Size Reduction		$771 million
	Creates the Class Size Reduction Program to reduce class sizes on a voluntary basis to no more than 20 pupils per certificated teacher in kindergarten through grade 3.				
AB 1656 Ch. 324/98	**SB 1789** (Greene)	(Ch. 164/96)	School Facilities Class Size Reduction		$200 million
	Establishes the Class Size Reduction Facilities Funding Program to assist school districts with the facilities-related costs associated with reducing class size in kindergarten and grades 1 to 3, inclusive.				
	SB 1414 (Greene)	(Ch. 621/96)	Class Size Reduction		
	Requires that funds allocated under the Class Size Reduction Facilities Funding Program must be expended solely for the purpose of school facilities-related costs associated with the implementation of the Class Size Reduction Program.				
Other Activities	**AB 862** (Ducheny)	(Ch. 332/98)	California Public School Library Act		$158.5 million ($28 per ADA)
	Enables districts that develop a district-wide library plan to purchase school library resources. Library resources, defined as those materials that are used in or circulated from the school library media center, include books, periodicals, microfilms, AV materials, computer software, CD Roms, and online resources. Equipment to provide access to library resources in the library media center may also be purchased with these funds.				
	SB 316 (Hayden)	(Ch. 811/97)	Student Academic Partnership Program	K-6	$5 million (Goals 2000) Pursuant to 1997-98 Budget Act (AB 107, Ch. 282/97)
	Grants to LEAs for preservice training, with highest priority for funding given to those agencies that propose to train and hire college students as academic tutors for pupils in kindergarten or any of grades 1 to 6, inclusive, in the academic areas of English-language arts and mathematics.				

Component	Bill No.	Ch./Yr.	Title	Gr.	Appropriation
Other Activities *(continued)*	**Goals 2000**	(Ch. 282/97, § J (PL 103-277)		K-8	$230,000
	Provides funding to establish a depository of certified staff development training materials, adopted or supplemental instructional materials, and other materials associated with research studies meeting the definition of research-based as delineated in AB 3482 and AB 1086; and place these materials in all of the State Learning Resource Display Centers (and any other appropriate public educational agencies or institutions).				
	AB 3482 (Davis)	(Ch. 196/96)	Comprehensive Reading Leadership Program		$2 million (General Funds) *$400,000 to develop materials $1.6 million to regional trainers*
	Provides funding to develop a program and materials and to deliver the program in each region of the state. The purpose of the program is to inform school board members, teacher leaders, and administrators about the California Reading Initiative and appropriate reading instruction.				
	Goals 2000 (PL 103-277)	(1995-96 FY)	Implementation of Reading Task Force Recommendations		$548,000 (State Operations)
"Raising Expectations, Achievement and Development (READ) in Schools" Initiative	AB 2X (Mazzoni)	Spring 1999	Reading Program/ Teacher and Principal Preparation Program	K-12	$94 million
	Provides funding for instruction for students, training for teachers and principals, rewards for schools where reading is emphasized, and a community involvement campaign to promote reading.				

For additional information, refer to the publication, *Guide to the California Reading Initiative* (1996-99), California State Board of Education.

Recent News Articles

Teaching Johnny to Read
The New York Times, Saturday, January 25, 1997

Betrayed in the Classroom
The New York Times, Monday, January 13, 1997

Why Johnny Can't Decode. by G. R. Lyon
Washington Post Education Review, October 27, 1996

Report on America's Reading Crisis, by Art Levine
Parents, October 1996

The New York Times

NEW YORK, SATURDAY, JANUARY 25, 1997

Teaching Johnny to Read

Americans have been deluged with studies that describe how schools fail. But few if any offer convincing answers to the question of why so many children find reading so difficult that they never learn. Long-term studies begun by the National Institutes of Health in the early 1980's are shedding light on this problem. The studies offer clear strategies for teaching children who struggle to read — and a cautionary tale for schools that would mainstream learning impaired children without making careful plans for their instruction.

Ten years ago, Congress directed the N.I.H. to increase its understanding of learning disabilities and how reading develops. The agency financed a series of studies that have followed about 2,500 young children, some of them for as long as 14 years. The studies, which employ brain imaging and other techniques, are conducted at several universities. The data show that a startling one in five American children have what the research director, G. Reid Lyon, terms "substantial difficulty" learning to read.

Contradicting a common stereotype, girls and boys were equally affected. Reading problems are just as common among children of above-average intelligence as among those who are slower. Impairment is found almost as often in children who grew up being read to as in those who grew up without a book in sight. Reading-impaired children are considerably more likely to drop out of school. Of those who graduate, fewer than 2 percent attend a four-year college.

The symptoms are varied. Some children labor over words, sounding out syllables and mispronouncing them. Others say the words easily but fail to comprehend them. N.I.H. researchers say the problem lies in the parts of the brain that process the written word. For many children the disorder is hereditary. For others the problem is insufficient exposure to language and reading. Nevertheless, about 96 percent improve after intensive help.

American educators recently engaged in a bitter and spurious debate about the relative merits of the "whole-language" approach, which often immerses children in literature at the expense of phonetic drill and practice, and the phonics approach, which provides drill and practice in phonetics and grammar. But the N.I.H. has concluded that both literature and phonics practice are necessary, for impaired and unimpaired children alike. The phonics component is vital for the 40 percent of children for whom word recognition is difficult.

These findings underscore the need to do a better job of training teachers. The N.I.H. researchers found that fewer than 10 percent of teachers actually know how to teach reading to children who don't get it automatically. This should shock everyone, from the President and Congress to the local school board. The country will need to do better if its children are to have any chance at all.

BRENT STAPLES

The New York Times

NEW YORK, MONDAY, JANUARY 13, 1997

Editorial Notebook

Betrayed in the Classroom

Learning Disabled — Or Curriculum Disabled?

Children with learning disabilities are many times more likely to be hyperactive, delinquent and to end up in prison. Educators can roll out case after case of otherwise bright, vivacious students who work frantically to keep up and are driven to the verge of suicide by continued and unexplained failure. The most well-known example is Shannon Carter, a learning-disabled student whose parents withdrew her from public school, sued the country for private-school tuition and won their case in the United States Supreme Court.

Problems like Shannon's would be alarming even if the number of learning disabled students remained constant. But national statistics show an increase nearly everywhere. In New York State, for example, the number jumped by about 55 percent, from 132,000 in 1983 to 204,000 in 1996. Part of the surge results from heightened sensitivity to a problem that went largely unrecognized until the disability laws of the 1970's. The numbers may also have gone up because funding formulas give additional aid for every student diagnosed as disabled. Two-thirds of the states are considering changes in the way special education is financed. A revision now supported by Gov. George Pataki would give each school district in New York a fixed sum, based on the statewide average.

The cost ceiling may be necessary. But New York and other states need to bear in mind that some of the surge, in learning-disabled children is genuine — the result of broad social trends, among them teaching techniques that make it difficult for disabled children to learn in mainstream classrooms.

Federal law mandates special education for children with a host of physical and psychological disabilities, like dyslexia, speech and hearing impairment. The Government also lists an oddly named category called "specific learning disability," defined as "a disorder of one or more of the basic psychological processes involved in understanding language or in using language."

The broadness of that description allows many districts to cram special classes with students who are disciplinary problems or slow learners. This trend toward warehousing accelerated as budget cuts stripped away teaching assistants, counselors and special instructors who once kept problem children on track. In New York City, under 10 percent of students are classified disabled, slightly under the statewide average of 11 percent. But more than 100 districts statewide exceed 15 percent, with many approaching 20 percent. The numbers are alarming because students who enter special education rarely graduate from high school.

Learning disability experts agree that many districts are guilty of over-referral. But many of the same experts argue that the increase in the learning-disabled population also has real antecedents. Middle-class mothers who once spent much of the day reading to and socializing with their children now work outside the home. Teen-age mothers who stay at home often lack the education or interest needed to prepare children for learning.

Disorganized schools, poorly equipped classrooms, unqualified teachers and other conditions that hurt unimpaired children are devastating to children with learning difficulties.

Some educators argue that children who have difficulty learning are "curriculum disabled" by teaching strategies that promote vague goals like self-esteem over traditional skills. One spokeswoman for this view is Phyllis Bertin, director of education at the Windward School in White Plains, N.Y. a private school for the learning disabled. Windward succeeds with students who performed poorly in public schools. It renovates their reading skills and then sends them back.

Ms. Bertin and her colleagues are incensed by the "whole language" system of reading that swept America during the 1980's. The approach, they say, often forsakes phonics, grammar and the drill-and-practice many children need to become competent readers and writers. Whole language still has many disciples, but California renounced it after the state's students finished 39th, tied with Louisiana as the worst readers among the states tested. It stands to reason that many students need a structured approach to reading if they are to succeed.

Budget ceilings will not solve the special education problem. Schools need to strengthen early-intervention programs and classroom instruction for all students, which means paying closer attention to what and how teachers teach.

BRENT STAPLES

Why Johnny Can't Decode

By G. Reid Lyon

ELIZABETH McPIKE of the American Federation of Teachers has written that if you do not learn to read, you simply do not make it in life. The research that we conduct and support at the National Institutes of Child Health and Human Development (NICHD) at the National Institutes of Health (NIH) bears this out in spades. A number of long-term studies funded by NICHD show that approximately 17 to 20 percent of our nation's children have substantial difficulties learning to read.

In contrast to what was once thought to be conventional wisdom, we have found that almost as many girls as boys have reading disabilities. Boys do seem to be identified more readily by the public school system as having difficulties in reading because they tend to be a bit more active and boisterous than their female agemates. Since it is typically the child's behavior, rather than academic difficulties, that prompts teachers to refer youngsters for special education services, the reading problems girls may have are frequently overlooked because they are generally well-behaved and socially adept.

Nevertheless, as we watch these boys and girls grow up, the negative effects of reading disabilities are abundant, and clear. During the early grades, their difficulties are quite embarrassing to them. This early humiliation leads to a predictable decrease in self-esteem and motivation. Over the years I have become increasingly saddened by the fact that little kids are not as resilient as I once thought they were. They are tender individuals, easily frustrated and ashamed of deficient skills once they notice that many of their classmates read so effortlessly. During the later grades, when youngsters should be reading to learn, their knowledge and interests in areas such as literature, science, mathematics and history are constrained simply because they can not readily acquire the concepts via print.

However, the consequences of reading failure go far beyond these academic outcomes. Anywhere from 10 to 15 percent of children with reading disabilities drop out of school prior to high school graduation. Of those who do graduate, less than 2 percent attend a four-year college, despite the fact that many are above average in intelligence. A quick survey of adolescents and young adults with histories of delinquent or criminal conduct indicates that approximately half have reading difficulties and similar rates of reading failure are seen among kids with substance abuse problems. No doubt, their occupational and vocational independence and success are compromised. As such, reading disability is not only an educational problem, it is a major public health and economic concern. It is for these reasons that the NICHD has aggressively sought to understand reading disabilities better-to discover what causes them, how long they last, and what we can do to prevent and remedy them. Over the past 20 years, we have learned a good deal, but we clearly need to learn more.

The Problem

IN ESSENCE, most reading disabilities can be observed as a person attempts to read the words on a page of print. The signs of disability are: a labored approach to decoding or "sounding out" unknown words and a repeated misidentification of known words. Reading is hesitant and characterized by frequent starts and stops and multiple mispronunciations. If asked about the meaning of what was just read, the individual frequently has little to say. Not because he or she isn't smart enough: in fact, many people with reading disabilities are very bright. Their poor comprehension occurs because they take far too long to read the words, leaving little energy for remembering and understanding what they have read. Simply put, their reading of words is extremely plodding and inaccurate rather than automatic and fluent.

Even individuals with relatively "mild" difficulties reading will tell you that they do not read for pleasure. Why? Because it's far too much work to be fun, and the process simply takes too long for the reader to remain interested in the material at hand.

Unfortunately, there is no way to bypass this decoding and word recognition stage of reading. A deficiency in these skills cannot be appreciably offset by using context to figure out the meaning of the misread words, particularly if the reader is slow and makes many errors. In essence, while one learns to read in order to derive meaning from print, the key to comprehension starts with the immediate and accurate reading of words.

Difficulties in decoding and word identification, while at the core of most difficulties, are not the only type of reading disability that can be observed. To be sure, some children can cipher words in a very rapid manner, yet still have difficulties comprehending what they have read. This type of disorder is now being studied by a number of NICHD-supported scientists, and we're beginning to understand how best to identify and address the problem.

The Causes

IF THE ABILITY to gain meaning from print is dependent on fast, accurate and automatic decoding and word identification, what kinds of things hinder the acquisition of these basic literacy skills? No doubt, young children who have a limited exposure to both oral language and print before they enter school are at risk. However, many youngsters whose early linguistic inexperience make learning to read difficult can reach appropriate literacy levels with early, intensive and informed instruction in kindergarten and first and second grades.

What is more puzzling are reading difficulties observed among children who have average to above average intelligence, robust oral language experience and frequent interactions with books-children frequently referred to as learning disabled or dyslexic. Many who are examined in NICHD studies have been read to regularly since infancy. Their speaking vocabularies are well developed and when read to, they can quickly understand and discuss the content in rich detail. However, when asked to read material appropriate for their age, they flounder.

Over the past decade, we have begun to understand why. Our language is an alphabetic one, meaning that to read it one must unlock the relationships between sounds and letters. Thus, a good reader knows the connections between the 40 or so sounds of spoken English (called phonemes) and the 26 letters of our alphabet. What our research has taught us is that in order for a beginning reader to learn how to map or translate printed symbols (let-

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ters and letter patterns) into sound, he or she must intuitively understand that speech can be segmented and that segmented units of speech can be represented by printed forms. This understanding is termed "phonological awareness" and is a critical prerequisite for decoding and word recognition, which, in turn, are essential for reading comprehension.

Why is phonological awareness so critical? Because if children cannot perceive the sounds in spoken words-for example, if they cannot "hear" the "at" sound in "fat" and "cat" and can't perceive that the difference lies in the first sound-they will have significant difficulties decoding words accurately and fluently. This awareness of the sound structure of our language seems so easy and commonplace that we take it for granted. But many youngsters do not develop it, and for some interesting reasons. Unlike writing, our speech does not consist of separate sounds in words. For example, while a written word like "cat" has three letter-sound units, the ear only hears one sound, not three when the word is spoken aloud. This merging and overlapping of sounds into a speech "bundle" makes oral communication much more efficient. Think how long it would take to have a conversation if each of the words we uttered were chopped into their sound system. We now have strong evidence that it is not the ear that understands that a spoken word like "cat" is divided into three sounds and that these sounds can be mapped onto the letters c-a-t, it is the brain. And in many individuals the brain is not processing this type of information in an efficient manner.

In essence, our research has taught us that reading disabilities occur much more frequently than initially thought, and that most of these disabilities reflect a specific language disorder that makes it tough for some children to understand that spoken words are made up of sound units that can be mapped onto letters and letter patterns so that they can "unlock" words that have never been read before. Without phonological awareness and the ability to rapidly label patterns of print with the appropriate sounds, children cannot develop useful letter-sound knowledge and will continue to guess at, rather than decode and recognize the words on the page.

The Genetic Link

WHEN CHILDREN display language-based reading disabilities, one begins to wonder about the origins of such difficulties. If the deficits cannot be explained by a lack of exposure to language patterns and literacy-based materials during the preschool years, a question that frequently arises is genetics involved? That is: Are the disabilities inherited? In addition, are the difficulties associated with how the brain functions?

The answer is a qualified yes to both questions, although certainly not for all poor readers. Over the past 20 years, data obtained from family, twin and chromosomal studies provide compelling evidence that reading disability can be found in families, is heritable and is most likely caused by one or more genes having a major effect on neural development. The data suggest that these genetic effects influence the decoding, word recognition and reading comprehension difficulties described earlier.

The specific mechanisms by which genetic factors predispose someone to reading disability are not fully clear. One possibility is that genetic alterations influence development in the neural systems that are responsible for identifying sounds in speech. Several recent studies have found that problems with phonological awareness are associated with atypical functioning in specific brain regions. This research information can be considered only suggestive at this time. Nevertheless, the recent explosion in the development of neuroimaging methods that can be used safely with children bodes well for scientific understanding of the neurobiological foundations of reading development and disabilities.

Can These Children Be Helped?

INDEED THEY CAN. Several ongoing reading intervention studies have found that many youngsters can learn to read quite well if instruction is provided early enough. In these studies, we have found that both early and informed intervention is critical. Why early? Because it seems that unless children are identified and provided with appropriate interventions by the second or third grade, their chances of "catching up" are reduced dramatically. This does not mean that we cannot succeed with older students. We can, but the cost in both time and money is essentially tripled.

A number of NICHD studies being conducted at different research sites have all reported that a balanced instructional program composed of direct instruction in phonological awareness, phonics and contextual reading is necessary to achieve gains in reading skills. Without a doubt, we have found that teaching methods that are based upon only one philosophy such as "the whole language approach" or, "the phonics method" are counterproductive for children with reading disabilities. No matter how bright the child and how interesting the reading material, a child will not learn to read unless he or she understands how print is translated into sound. Likewise, no matter how much phonological awareness and phonics knowledge a youngster has, the child will not want to engage in reading and writing unless it is meaningful and interesting and taught in an exciting and vibrant way.

Unfortunately, many teachers have not been adequately prepared to understand how reading develops and how to teach children to read using a balanced and integrated instruction approach that insures mastery of the sound structure of the language, phonics principles and contextual reading comprehension strategies. Frequently, teachers are trained in a "one size fits all" philosophy of instruction, which leads to failure in many of our children. In addition, the majority of youngsters who are identified in public schools as having difficulties are typically not given appropriate reading instruction until they have failed for at least two years. This is simply too late and reflects an unfortunate gap between what we know from our research and what is practiced in school.

Our NICHD-supported research has led to discoveries that can help us identify many children who will have difficulties learning to read as early as kindergarten. The research has also led to the development of a number of powerful teaching methods that can be applied during kindergarten, first and second grade to prevent and remediate reading failure. We must work harder to insure that school teachers and parents have this information.

Recommended Reading

Available to the public at no cost:

The NICHD Learning Disabilities/Reading Disabilities/Reading Disabilities Information Packet: Research Discoveries-Clinical Applications. Available from the National Institute of Child Health and Human Development/NIH. Contact: Rosa Jones 301-496-5097.

Learning Disabilities. Available from the National Institute of Mental Health. Con-

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tact: 5600 Fischers Lane, Room 7C02, Rockville, MD 20857.

Learning to Read-Reading to Learn, Information Kit, Contact: The National Center for Learning Disabilities. 212-545-7510.

Effective Strategies for Teaching Beginning Reading, by Ed Kameenui and others (1995). Available from the National Center to Improve the Tools of Educators. Contact: 541-346-1646.

Phonological Awareness: Curricular and Instructional Implications for Diverse Learners, by S.H. Smith and others (1955). Available from the National Center to Improve the Tools of Educators. Contact: 541-346-1646.

The Learning Disabilities Association Information Packet. Available from the Learning Disabilities Association of America. Contact: Jean Peterson 412-341-1515.

Commercial publications

Beginning to Read: Thinking and Learning About Print, by Marilyn J. Adams (MIT Press, 1990).

Learning to Read: Schooling's First Mission, edited by Elizabeth McPike (American Educator, 1995), Available from the American Federation of Teachers. Contact: Beth Bader 202-879-4561.

The Orton Dyslexia Society Emeritus Series (monographs dedicated to specific issues in dyslexia). Available from the Orton Dyslexia Society, Contact: 410-396-0232.

From Letters to Sounds

SAM'S PARENTS became worried about his behavior and academic performance in school when he was 8 years old and midway through his second-grade year. It was then Sam's teacher called to discuss some disturbing changes in his behavior. Sam was becoming increasingly inattentive during the classroom reading period, and had recently been involved in a scuffle at recess because another student had called him stupid.

Sam's teacher reported that his emerging behavioral difficulties might be related to his persistent difficulties developing reading and spelling skills. According to her, he had made little progress since beginning his second grade year. When reading aloud he would guess incorrectly at words that he had seen many times. Frequently he would make errors that were not real words, and his hesitations, repetitions and omissions of words when reading made comprehending what he was attempting to read impossible. Equally worrisome was how embarrassed and frustrated he would become when asked to read in front of the class.

His mother recalled that at the beginning of the year Sam was not as enthusiastic about starting school as he had been in previous years, and he even asked her if he could "go to school at home." While Sam's parents thought this was nothing more than the usual first-day jitters, the teacher's comments led them to decide to consult a psychologist specializing in behavioral and learning differences in children.

During the initial conference, Sam's parents reported that there were no concerns about his early motor and language development. He had adapted easily to nursery school and kindergarten, but his kindergarten teacher reported that Sam was having some difficulty learning the names of the letters in the alphabet and frequently mislabeled numbers. She also indicated that he had some difficulties playing rhyming games.

At a midyear conference during his first-grade year, Sam's teacher noted that his understanding of basic math concepts was excellent, but that he was having some difficulty mastering basic reading and spelling skills. Sam's mother had told her that while Sam still loved to listen to her read to him, and could discuss those stories in detail, he couldn't read along with her as her two older children always had. When Sam did try to read out loud, he frequently guessed at words and was inconsistent in their pronunciation.

A thorough evaluation by the psychologist showed Sam was above average in general intelligence and had superior spatial and drawing skills. His vocabulary was well-developed for his age and his ability to listen to reading and answer questions about it was good, even when the material was drawn from third and fourth grade-level books.

But Sam had significant difficulties when asked to listen to, isolate and combine specific sounds. For example, he could not identify the first sound in fish, was unable to combine the sounds /s/ /a/ /t/ into the word sat, and could not say the word that would be left if the /k/ sound was taken away from cat. While he knew that the letter *s* makes the /Ssss/ sound, he did understand that the words *sit*, *sun*, and *small* all begin with this sound.

IN ADDITION, Sam read words that he had seen many times inaccurately and slowly. When asked to read words that he had never seen before, but that he should be able to decode like NIZ or TUD, he guessed incorrectly on the basis of the first sound, rather than attempting to "sound out" the words. His spelling reflected similar sound errors. he spelled cat as kud, and as ad, and wet as yeid. He was unable to comprehend the meanings of the majority of sentences that he read although he could easily understand their meanings if they were read to him.

The psychologist had very clear indications that Sam's reading difficulties were serious and most likely caused by problems with "phonological processing." This somewhat, intimidating, jargonistic term simply refers to the knowledge that words are composed of sounds (or phonemes).

Why is phonological processing so important in Sam's reading development? To read the word sat correctly, he must

(a) translate the word into the individual phonemes (/s/, /a/, /t/).

(b) remember the correct sequence of these sounds.

(c) blend these sounds together quickly, and

(d) search his memory for a real word that matches this string of sounds.

Sam must eventually be able to accomplish all of these steps in an automatic and fluid manner in order to understand the meaning of what he has read. Unfortunately, and despite his intellectual and academic strengths, the first translation step is dependent upon being aware that the word sat is actually composed of three sounds rather than one, and that is enormously difficult for him. But without that awareness, rendering steps b, c, and d, as well as comprehending what he is reading was almost impossible to carry out.

Can Sam become a good reader? Yes, but not on his own. To wait for Sam to "catch up" is to court disaster. He must be helped to develop an explicit awareness of the connection between sounds and letters and sounds and words. Mold that knowledge into the task of blending the sounds and reading the words. And he must feel, all the while, that he is absorbing a meaningful and interesting text. Pay now or pay later.

— G. Reid Lyon

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Report on America's Reading Crisis

Why the whole-language approach to teaching has failed millions of children

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In 1988, the administrators at Highland Elementary School, in Bakersfield, California, launched a bold new experiment in teaching reading, "They took away our phonics books and spelling books, "recalls Diana Garchow, who taught kindergarten through fifth grade at the school. In place of textbooks, school officials supplied a state-approved anthology of children's stories and poems, such as "City Mouse & Country Mouse." The theory was that children could best learn to read by being immersed in interesting literature. Systematic instruction in "decoding" skills was down-played, replaced by the concept of "whole language."

Experienced teachers soon realized, however, that many of their students were floundering in reading. First-graders couldn't read simple words (some had trouble with the word "the") that previous classes had mastered by then. The situation worsened as time passed; in second and third grades, students who had been taught by the new reading method couldn't understand science and history textbooks.

By 1994, California reading scores had plummeted in state rankings — from middle to dead last, tied with Louisiana- according to federal reading surveys and other reports. National tests showed that 60 percent of the state's students couldn't even read at a basic level. In the spring of 1995, a state task force branded the seven-year-old reading experiment a failure. In June of this year, state education agencies followed up by issuing an in-depth guide to teaching skills that repudiated the whole-language philosophy of rejecting skills-based phonics.

"What happened in California was a disaster," says Marion Joseph, a veteran education expert and member of the task force. "Our state had failed by eliminating systematic instruction in basic skills." For Joseph, the problem hit painfully close to home. Her grandson, Isaac, had enormous difficulty learning to read after whole language was introduced into his school in 1988. Private tutoring brought Isaac up to speed, but Joseph discovered that her grandson's struggles with the whole-language approach were commonplace. She determinedly launched a statewide lobbying effort to get rid of the teaching method.

Her concerns are being echoed nationwide by thousands of parents, who have been fighting for more skills instruction in schools. Parents have pressed at least 15 state legislatures to pass prophonics legislation. And many parents have had to hire private tutors to teach the reading skills their schools ignored. At the same time, there has been an increase in the number of children enrolled in special-education classes and remedial-tutoring programs, according to Bob Sweet Jr., of The National Right to Read Foundation, a pro-phonics group.

With so many complaints, a question remains; How did an educational approach that came to dominate a majority of American classrooms — and most institutions that train teachers — fail to teach thousands of kids to read?

The critics of whole language point to major flaws in both the central tenets of the philosophy and the way it's been applied in schools. Bill Honig, Ph.D., the former state superintendent of schools in California, led the way in developing the state's pro-whole language guidelines in the late 1980s, but has now become sharply critical of the elimination of phonics. "If you don't have an organized program to teach skills directly, you're going to have a gap in your reading program." he notes, "It's like trying to play baseball without being taught the skill of hitting." Yet Honig also pinpoints whole language's underlying appeal to educators: "It resonates with the progressive, child-centered idea that you don't have to teach kids to read — it's natural. If that were true, it would be more fun than slogging through the teaching of letter-sound correspondences."

The crucial skills that whole language ignores

Indeed, at first glance, whole language has several appealing features. Instead of using the old-fashioned "drill and kill" programs that gave phonics such a dreary reputation, a whole-language teacher reads aloud from a large-print book while children follow along, sometimes chanting unison with the teacher. When children encounter a word they have difficulty reading, they're encouraged to guess its meaning by using pictures and context clues, and are often discouraged from trying to sound it out. When they *are* shown how to use phonics to figure out words, it's not done in separate, sequential lessons, but only when they happen to ask for help. In addition, kids are encouraged to do a lot of writing on topics of their choice, and are free to use "invented spelling," which can go uncorrected sometimes until the next lesson, sometimes indefinitely.

Whole-language proponents contend that the most important goal of reading isn't word-by-word accuracy, but the ability to understand a book's meaning. "You learn to read and write the way you learn to talk, by being surrounded by people who read and write for real reasons," says Jean Fennancy, Ed.D., director of reading/language arts at Fresno Pacific College.

But critics counter that this approach often leads children to memorize the text rather than learning how to read, and puts them at a disadvantage when confronting words they've never seen before. A host of comparative studies and federal reports show that programs that include systematic phonics instruction are generally more effective than those that do not — especially for at-risk kids. These studies have debunked each tenet of the whole-language gospel. Among the findings: Unlike speech, reading is not acquired naturally: guessing is an ineffective reading tool: skilled readers do read virtually every letter and word of a passage; direct instruction in sounding out words does not hinder learning to read. In fact, notes Honig, who is also the author of *Teaching Our Children to Read* (Corwin Press), "just the opposite is true: You have got to help people see parts of words if they're going to learn the alphabetic system."

Recently, a new curriculum has been developed called the Science Research Associates Open Court program, which combines some whole-language techniques with key elements of modern phonics. This spring, a test program in Houston found that Open Court was about twice as effective at improving reading among disadvantaged students as whole-language instruction alone. The Open Court students were brought close to the national average, while the whole-language students languished in

the lowest quartile. "We were astounded by this kind of growth," says the University of Houston's Barbara Foorman, who conducted the study that compared the different approaches. "We learned that direct instruction is very impressive." (Whole-language advocates typically dismiss studies that use standardized tests to measure achievement, claiming that such tests don't reflect "real-world" conditions.)

The Open Court program also promotes "phonemic awareness" among students: the ability to become aware of and manipulate the sounds that make up spoken words. About 20 percent of all students have some difficulties with this skill, according to Reid Lyon, Ph.D., chief of the learning-disabilities and developmental-psychology branch of the National Institute of Child Health and Human Development (NICHHD), in Bethesda, Maryland. Research funded by the organization has concluded that a lack of phonemic awareness is the best predictor of reading disabilities. But the problem can generally be overcome with such techniques as rhyming games, clapping on syllables, and other awareness exercise, combined with modern phonics. In the Open Court program, for example, the teacher uses a hand puppet that says only parts of words-children must fill in the rest. Understanding that letters represent speech sounds is critical to reading success, so learning to read depends on acquiring phonemic awareness, says Lyon.

In Open Court and other effective phonics programs, letter-sound correspondences are taught in a series of short, accessible lessons. They start with instruction in the simplest consonants and short vowels, such as "fit" or "fat," using flash cards and alliterative stories. As soon as possible, children read "decodable" stories, composed of words with the letter-sound patterns they've just been taught. A balanced phonics program also borrows techniques from whole language, including extensive writing (buttressed by spelling lessons) and the use of actual children's literature, which children read *after* they have mastered some basic phonics skills

Troubled readers don't "grow out of it"

Such phonics programs are particularly essential for children with reading problems, experts say. While whole-language proponents claim troubled readers will eventually "grow out" of their problems over time. NICHHD research has proved otherwise. For most of these children, Lyon maintains, teaching whole language alone is tantamount to "educational malpractice."

Just ask Alexis Muskie, the daughter-in-law of the late senator Edmund Muskie, of Maine. The Peterborough, New Hampshire, housewife agonized as her daughter Olivia struggled to read and write after entering first grade four years ago. Olivia went into the class knowing how to write her own name, but by the end of the school year, she wouldn't spell it correctly. "My teacher says I can spell any way I want." she announced to her mother. At various times over the next two years, Muskie says, the school reassured her that Olivia was making progress and would eventually catch up. Instead the girl developed headaches and nightmares as her reading remained impaired. Ultimately, special testing showed that her reading was well below grade level. Muskie arranged for phonics tutoring and visits to a reading clinic that taught phonemic awareness in part by training students to feel the way their lips, mouth, and tongue form speech sounds. By the fourth grade, Olivia's reading skills were up to grade level. But Muskie is still bitter over the wasted years: "She was coming home frustrated, uptight, anxious. I was losing her. The public school's reading strategy was clearly failing her."

Even critics of the whole-language approach concede that it has brought some welcome innovations to the public schools, such as adding more real literature and writing. The philosophy has garnered the support of some of the country's most dedicated teachers, and certain students have flourished under the system. Parent Mary Vondrak, of Wheeling, Illinois, for instance, says, "My son learned to read very naturally with whole language. He's very motivated to read." Still, the most effective teachers, even those who consider themselves whole-language adherents, combine a strong direct-skills component with interesting reading material, according to research by Michael Pressley, Ph.D., a professor at the State University of New York at Albany. "We've found that a balanced approach consistently comes out on top," he says.

Despite the growing consensus among respected researchers about the need for such balance, it may take a while for educators to accept this view. As Pressley says, "There's a war going on." For parents concerned about reading, it seems, plenty of battles lie ahead.

How good is your child's reading program?

Most reading experts agree that children need a balanced reading curriculum, combining phonics instruction, phonemic-awareness exercises, and spelling lessons. How do you make sure that your child is getting what she needs? Experts provide the following tips.

• Determine how well your child can read right now. By the middle of first grade, children should have been taught enough skills to independently read at appropriate levels of difficulty. Ask your child to read aloud from a new book that is geared to the correct grade level.

• Test your child's ability to "decode" individual words. By the end of December in the school year, a first-grader should be able to easily read such sentences as these:

The big red hen is mad
Did Bob get on the bus?

• Ask your child's teacher about her approach to teaching phonics. Your goal is to make sure it's done through systematic lessons. Stories for beginning readers should be made up of words that reflect the letter-sound patterns they've been taught. Be wary if the teacher's response is that children are encouraged to use predicting (i.e., guessing) words, or that phonics is taught only in the context of reading.

• Speak up if you're not satisfied. Petition the school board to allow at least some classrooms to offer a more skills-based curriculum.

Where to find help

Here are some resources that will help parents test their children, provide at-home phonics training, and understand the elements of effective reading instruction.

The National Right to Read Foundation offers an at-home phonics test for $10, geared to different grade levels (for information call 1-800-468-8911). Bob Sweet Jr., the foundation's president, also recommends some home-instruction courses, particularly if your child's school isn't offering direct instruction in phonics. He cites Sing, Speak, Read and Write ($175; 1-800-321-8322): Action Reading Fast Track ($129, 1-800-378-1046): and S.R.A. Open Court ($270: 1-800-843-8855), among others.

A guide to California's new balanced curriculum, Program Advisory: *Teaching Reading*, is available for $5.25, plus shipping and handling (1-800-995-4099).